



# User's Guide

DS-I

Durable Series

1-3KVA

## Important Safety Instructions

### Save these instructions

This manual contains important safety instructions. Read all safety and operating instructions before operating the uninterruptible power systems (UPS). Adhere to all warnings on the unit and in this manual. Follow all operating and user instructions. This equipment can be operated by individuals without previous training.

Maximum load must not exceed that shown on the UPS rating label. The UPS is designed for data processing equipment. If uncertain, consult your dealer or local representative.

The 1-3kVA @200/208/220/230/240VAC is designed for use with a three-wire input (L,N,G).



WARNING

***The battery can present a risk of electrical shock and high short circuit current. Following precautions should be observed before replacing the battery.***

- Wear rubber gloves and boots.
- Remove rings, watches and other metal objects.
- Use tools with insulated handles.
- Do not lay tools or other metal objects on the batteries.
- If the battery is damaged in any way or shows signs of leakage, contact your local representative immediately.
- Do not dispose of batteries in a fire. The batteries may explode.
- Handle, transport and recycle batteries in accordance with local representative.



WARNING

***Although the UPS has been designed and manufactured to ensure personal safety, improper use can result in electrical shock or fire. To ensure safety, observe the following precautions:***

- Turn off and unplug the UPS before cleaning it.
- Clean the UPS with a dry cloth. Do not use liquid or aerosol cleaners.
- Never block or insert any objects into the ventilation holes or other openings of the UPS.
- Do not place the UPS power cord where it might be damaged.

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# 1. Electromagnetic Compatibility

<b>* Safety</b>	
IEC/EN 62040-1-1	
<b>* EMI</b>	
Conducted Emission.....IEC/EN 62040-2	Class A
Radiated Emission.....IEC/EN 62040-2	Class A
<b>*EMS</b>	
ESD.....IEC/EN 61000-4-2	Level 4
RS.....IEC/EN 61000-4-3	Level 3
EFT.....IEC/EN 61000-4-4	Level 4
SURGE.....IEC/EN 61000-4-5	Level 4
Low Frequency Signals.....IEC/EN 61000-2-2	
<b>Warning:</b> This is a product for commercial and industrial application in the second environment-installation restrictions or additional measures may be needed to prevent disturbances.	

**NOTICE:**

This is a product for restricted sales distribution to informed partners. Installation restrictions or additional measures may be needed to prevent radio interference.

Operated the UPS in an indoor enviroment only in an ambient temperature range of 0-40°C(32-104°F). Install it in a clean environment, free from moisture, flammable liquids, gases and corrosive substance.

This UPS contains no user-serviceable parts except the internal battery pack. The UPS on/off push buttons do not electrically isolate internal parts. Under no circumstance attempt to gain access internally, due to the risk of electric shock or burn.

Do not continue to use the UPS if the panel indications are not in accordance with these operating instructions or the UPS performance alters in use. Refer all fault to your dealer. Servicing of batteries should be performed or supervised by personnel knowledgeable of batteries and the precautions. Keep unauthorized personnel away from the batteries. Proper disposal of batteries is required. Refer to your local laws and regulations for disposal requirement.

DO NOT CONNECT equipment that could overload the UPS or demand DC current from the UPS, for example: electric drills, vacuum cleaners, laser printers, hair dryer or any appliance using half-wave rectification.

Storing magnetic media on top of the UPS may result in data loss or corruption.

Turn off and isolate the UPS before cleaning it. Use only a soft cloth, never liquid or aerosol cleaners.

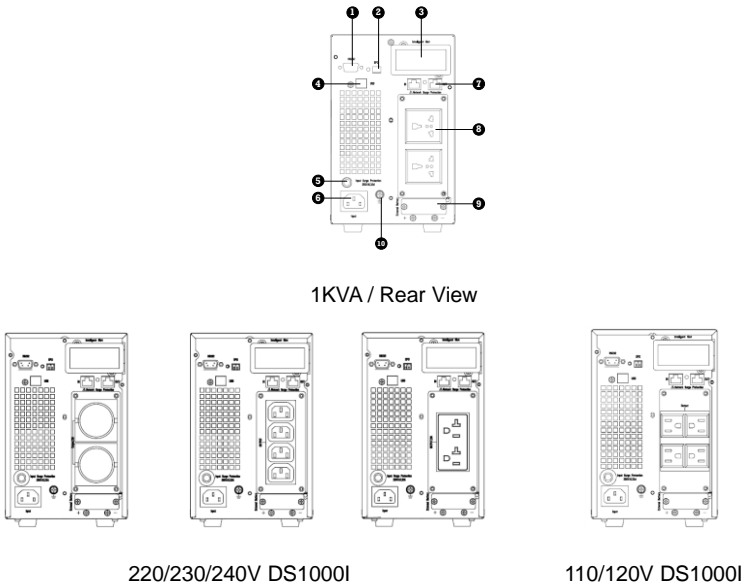
## 2. Introduction

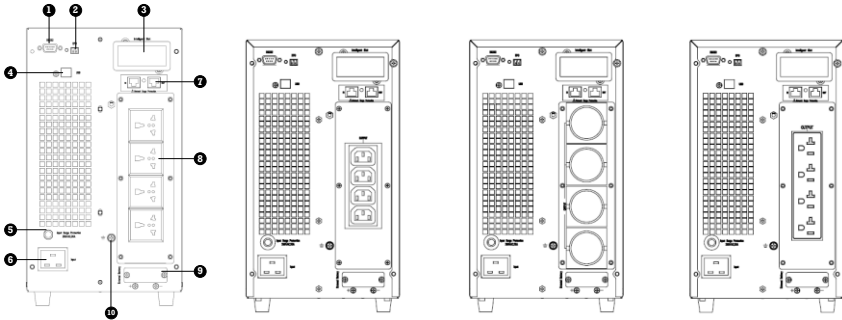
Congratulations on your choice of the uninterruptible power system (UPS), the UPS comes in nominal power ratings of 1000VA, 2000VA and 3000VA. It is designed to provide conditioned power to microcomputers and other sensitive electronic equipment.

When it is generated, alternating current is clean and stable. However, during transmission and distribution it may be subject to voltage sags, spikes and complete power failure that may interrupt computer operations, cause data loss and even damage equipment. The UPS protects equipment from these disturbances.

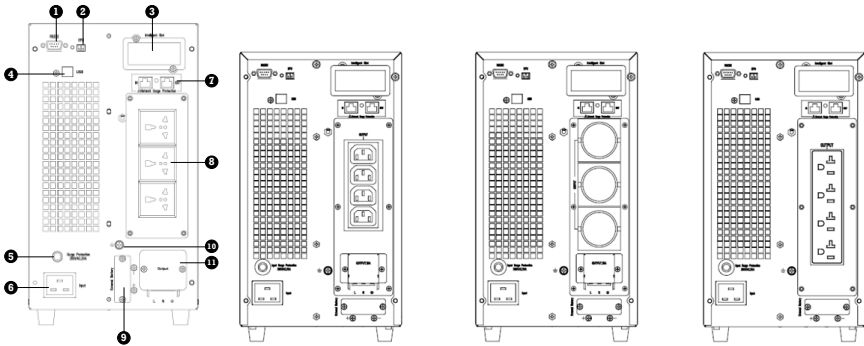
The UPS is a compact, on-line UPS. An on-line UPS continuously conditions and regulates its output voltage, whether utility power is present or not. It supplies connected equipment with clean sine-wave power. Sensitive electronic equipment operates best from sine-wave power. For ease of use, the UPS features a LCD display to indicate all information for UPS, and provide kinds of function buttons.

Fig 1.

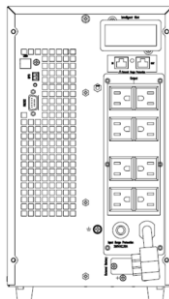




220/230/240V DS2000I



220/230/240V DS3000I



110/120V DS2000/3000I

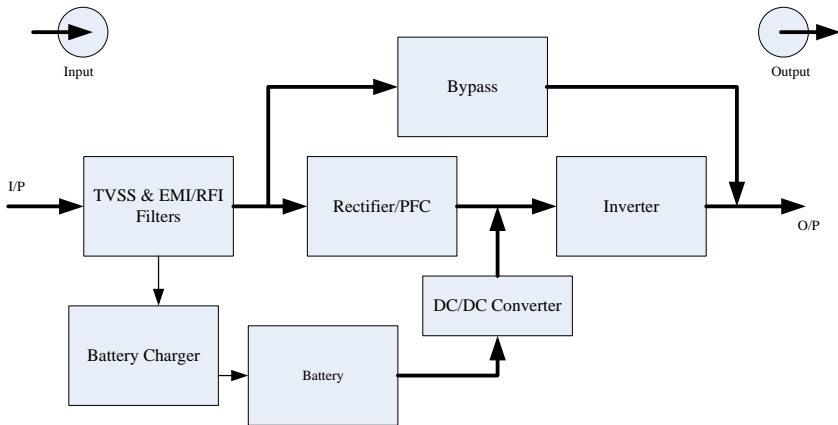
Fig 2. Rear View

## Introduction

<b>❶</b>	RS-232 communication port. DB9 type.
<b>❷</b>	EPO. Short to activate.
<b>❸</b>	Intelligent slot
<b>❹</b>	USB port
<b>❺</b>	Input surge protection slot.
<b>❻</b>	Input socket. 2x0V 1KVA: IEC C14, 2K/3K: IEC C20 1x0V DS1000I: IEC C14; DS1500/2000I : NEMA 6-20P
<b>❼</b>	Network surge protection.
<b>❽</b>	Output Socket.2x0V DS1000 / 2000I: IEC320*4; DS3000I: IEC320*4 + Terminal 1x0V DS1000I: 4*NEMA; DS2000/3000I: 8*NEMA
<b>❾</b>	External battery port. Optional for Long Back-up model.
<b>❿</b>	Battery ground
<b>⓫</b>	Output terminal



### 3. System Description



#### 3.1 Transient Voltage Surge Suppression (TVSS) and EMI/RFI Filters

These UPS components provide surge protection and filter both electromagnetic interference (EMI) and radio frequency interference (RFI). They minimize any surge or interference present in the utility line and keep the sensitive equipment protected.

#### 3.2 Rectifier/Power Factor Correction (PFC) Circuit

In normal operation, the rectifier/power factor correction (PFC) circuit converts utility AC power to regulated DC power for use by the inverter while ensuring that the waveform of the input current used by the UPS is near ideal. Extracting this sine-wave input current achieves two objects:

- The utility power is used as efficiency as possible by the UPS.
- The amount of distortion reflected on the utility is reduced.

This results in cleaner power being available to other devices in the building not being protected by the UPS.

#### 3.3 Inverter

In normal operation, the inverter utilizes the DC output of the power factor correction circuit and inverts it into precise, regulated sine-wave AC power. Upon a utility power failure, the inverter receives its required energy from the battery through the DC-to-DC converter. In both modes of operation, the UPS inverter is on-line and continuously generating clean, precise, regulated AC output power.

#### 3.4 Battery Charger

The battery charger utilizes energy from the utility power and precisely regulates it to continuously float charge the batteries. The batteries are being charged whenever the UPS is

connected to utility power.

### 3.5 DC-to-DC Converter

The DC-to-DC converter utilizes energy from the battery system and raises the DC voltage to the optimum operating voltage for the inverter. The converter includes boost circuit which is also used as PFC.

### 3.6 Battery

The standard model includes value-regulated, non-spillage, lead acid batteries inside. To maintain battery design life, operate the UPS in an ambient temperature of 15-25°C.

### 3.7 Dynamic Bypass

The UPS provides an alternate path for utility power to the connected load in the unlikely event of a UPS malfunction. Should the UPS have an overload, over temperature or any other failure condition, the UPS automatically transfers the connected load to bypass. Bypass operation is indicated by an audible alarm and illuminated amber Bypass LED.

**NOTICE:** *The bypass power path does NOT protect the connected equipment from disturbances in the utility supply.*

## 4. Product Specification and performance

### 4.1 Model Description

This manual is applicable to the following models:

Model No.	Type
DS1000I	Standard model
	Long backup model
DS2000I	Standard model
	Long backup model
DS3000I	Standard model
	Long backup model

### 4.2 Product Specification and Performance

#### 1. General Specification 2X0V

Model		DS1000I	DS2000I	DS3000I
Power Rating		1KVA/0.9KW	2KVA/1.8KW	3KVA/2.7KW
Frequency (Hz)		50/60	50/60	50/60
Input	Voltage	176Vac~288Vac		
	Current	5.5A max.	11A max	16A max
Battery	Voltage	36VDC	72VDC	96VDC
	Current	35A max	35A max	37A max
Output	Voltage	200V/208V/220V/230V/240V		
	Current	5/4.8/4.5/4.3/4.2A	10/9.6/9/8.6/8.4A	15/14.4/13.5/12.9/12.6A
Dimension (W*D*H) mm		144*353*222	190*374*336	190*426*336
Weight (kg)		12	21	26

#### General Specification 1X0V

Model		DS1000I	DS2000I	DS3000I
Power Rating		800VA/720W	1.5KVA/1.35KW	2KVA/1.8KW
Frequency (Hz)		50/60	50/60	50/60
Input	Voltage	96Vac~155Vac		
	Current	8.5A max.	15.5A max	20.7A max

## Product Specification and performance

<b>Battery</b>	<b>Voltage</b>	36VDC	72VDC	72VDC
	<b>Current</b>	31A max	30A max	35A max
<b>Output</b>	<b>Voltage</b>	110V/115V/120V/127Vac (120V Default)		
	<b>Current</b>	6.7A	12.5A	16.7A
<b>Dimension (W*D*H) mm</b>		144*353*222	190*374*336	190*374*336
<b>Weight (kg)</b>		12	22	22

### 2. Electrical Performance

Input					
Model		Voltage		Frequency	Power Factor
DS1000/2000/3000I		Single-phase		40-70Hz	>0.98(Full load)
Output					
Voltage Regulation	Power Factor	Frequency tolerance.	Distortion	Overload capacity	Crest ratio
±1%	0.9 lag	±0.5% of normal	THD<1% @Fu II Linear Load THD<6% @Fu II nonlinear load	130% load: transfers to Bypass mode after 1 minutes 150% load: transfers to Bypass mode after 0.5 minute	3:1 maximum

### 3. Operating Environment

Temperature	Humidity	Altitude	Storage temperature
0°C-40°C	<95%	<1000m	-20°C-70°C

**NOTICE:** If the UPS is installed or used in a place where the altitude is above than **1000m**, the output power must be de-rated in use, please refer to the following:

Altitude (M)	1000	1500	2000	2500	3000	3500	4000	4500	5000
De-rating Power	100%	95%	91%	86%	82%	78%	74%	70%	67%

## 5. Installation

**NOTICE:** *UPS operation in sustained temperature outside the range of 15-25°C (59°-77°F) reduces battery life.*

### 5.1 Unpacking and Inspection

- 1) Unpack the packaging and check the package contents. The shipping package contains:
  - 1 UPS
  - 1 user manual
  - 1 Communication cable
- 2) Inspect the appearance of the UPS to see if there is any damage during transportation. Do not turn on the unit and notify the carrier and dealer immediately if there is any damage or lacking of some parts.

### 5.2 Connect Input/Output Power

#### 5.2.1 Notes for installation

- 1) The UPS must be installed in a location with good ventilation, far away from water, inflammable gas and corrosive agents.
- 2) Ensure the air vents on the front and rear of the UPS are not blocked so as to ensure good ventilation.
- 3) Condensation to water drops may occur if the UPS is unpacked in a very low temperature environment. In this case it is necessary to wait until the UPS is fully dried inside out before proceeding installation and use. Otherwise there are hazards of electric shock.

#### 5.2.2 Installation

##### 5.2.2.1 Connecting Input and Output Cables

###### 1. Input cable connection

The UPS is connected via the power plug, please use a proper socket with protection against electric current, and pay attention to the capacity of the socket:  
2x0V over 10A for DS1000I, over 16A for DS2000I and DS3000I.  
1x0V over 10A for DS1000I, over 20A for DS2000I and over 25A for DS3000I.

###### 2. Output cable connection

The total output power shall not exceed **General Specification**. Simply plug the load power cable to the output socket of UPS to complete connection.

\*Except from using socket as output, 3KVA has output terminal as well for load whose current is over 10A.

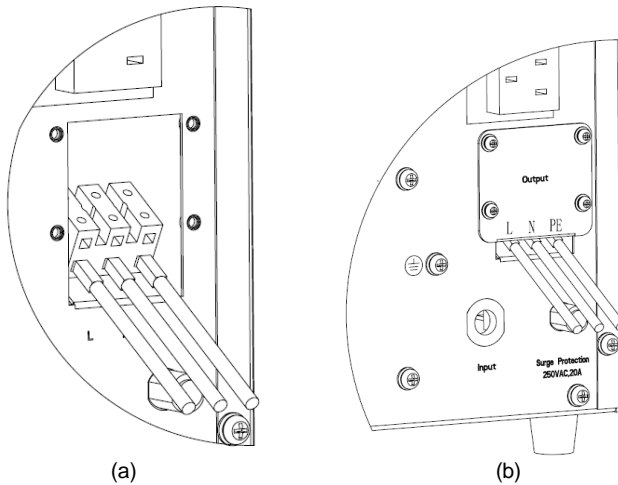


Fig.3 Output terminal of 3KVA

- 1). Remove the cover of output terminal
- 2). Use AWG14 wires for terminal wiring configuration as fig.3 (a)
- 3). Please check if the wires are securely affixed
- 4). Put back the cover to the rear panel as fig.3 (b).

### 5.3 Operating procedure for connecting the long backup time model UPS with the external battery

1. The nominal DC voltage of external battery pack please refer to General Specification. Connect in series the batteries of the pack to ensure proper battery voltage. To achieve longer backup time, it is possible to connect multi-battery packs, but the principle of “same voltage, same type” should be strictly followed.

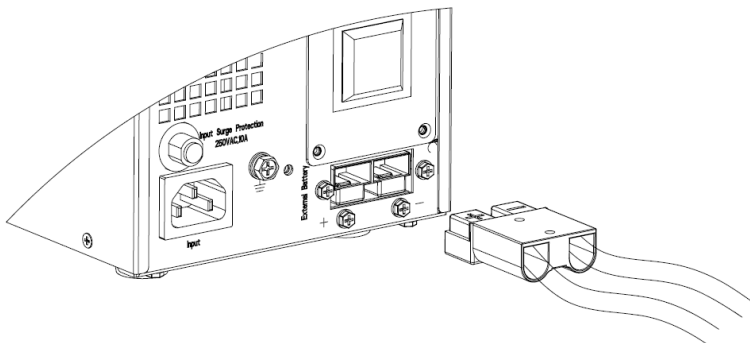


Fig.4 Battery terminal connection

2. Take out battery cable delivered with the UPS. One end of battery cable is a plug and the other end has 2 open wires.
3. Connect the RED wire to the "+" terminal of the battery. Connect the BLACK wire to the "-" terminal of the battery.

**Notice:** *DO NOT connect the battery plug to the battery socket of UPS first, otherwise, it may cause electric shock.*

4. Connect the external battery plug to the battery socket on the rear panel.

6. Controls and Indicators

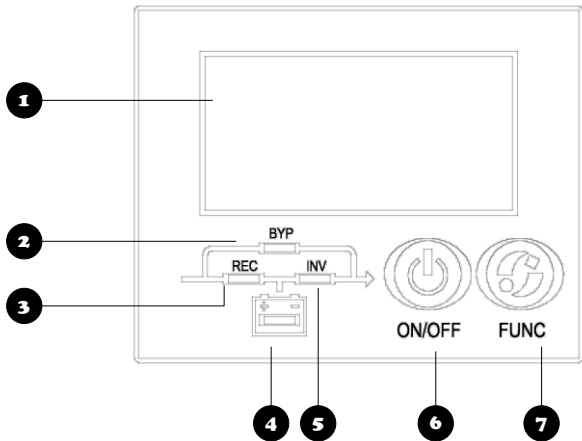


Fig.5 Display Panel

Description of Panel

Controls	Description
<div>6</div> ON/OFF	<p>1.Press ON/OFF to start UPS when utility is normal</p> <p><b>NOTE</b></p> <p><i>It only bases on default setting(manual start)</i></p> <p>2.Press ON/OFF to start from battery directly when there is no main input, press again to start UPS upon buzzer alarms</p> <p>3. Press ON/OFF to shutdown inverter when UPS is in normal mode.</p> <p>4.Press ON/OFF to shutdown UPS completely when UPS is in battery mode</p> <p>5.Press ON/OFF to ensure the rated parameter setting</p>
<div>7</div> FUNC	<p>1.Press FUNC button to transfer in different menus</p> <p>2.Press FUNC button for 3 seconds to mute off</p> <p>3.Press FUNC and ON/OFF together for 2.5 seconds to set rated parameters when only power supply is on</p>
Indicators	Description



<b>3</b> REC	Rectifier indicator: green--rectifier is normal, green flicker--rectifier is starting, dark—rectifier is not working
<b>5</b> Inv	Inv indicator: green--inverter is normal green flicker--inverter is starting or tracking with bypass(ECO) dark—inverter is not working
<b>2</b> BYP	Bypass indicator: yellow—bypass is normal dark—bypass is not working
<b>4</b> BAT	Battery indicator: yellow—battery discharge or charged yellow flicker—battery is not connected, battery is low or charger is failure dark—battery is connected

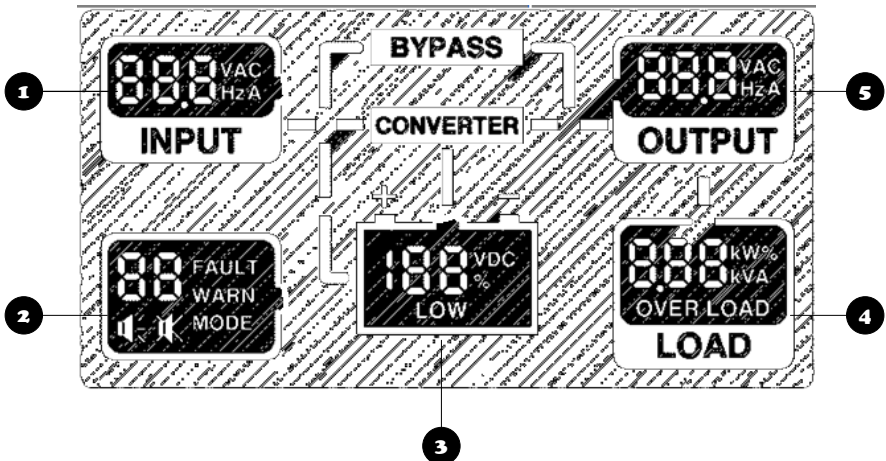




Fig 6. LCD Main Menu

## Description of Main Menu

Display	Function	Submenu
<b>1</b>	Input information	Input voltage(VAC), Input frequency(Hz), Input current(A)
<b>2</b>	Warn information	Fault code(FAULT), Warn code(WARN), Working mode (First number: n-normal mode, E-ECO mode. Second number: rated voltage and frequency 2x0V 0-200V/50Hz, 1-200V/60Hz, 2-208V/50Hz, 3-208V/60Hz, 4-220V/50Hz, 5-220V/60Hz, 6-230V/50Hz, 7-230V/60Hz, 8-240V/50Hz, 9-240V/60Hz) 1x0V A-110V/50Hz, B-110V/60Hz C-115V/50Hz, D-115V/60Hz E-120V/50Hz, F-120V/60Hz H-127V/50Hz, L-127V/60Hz Mute on(  ), mute off(  )
<b>3</b>	Battery information	Battery voltage(VDC), Capacity(%) if needed, Firmware version, Battery low warn(LOW)

4	Load information	Load percent (%) Active load(kW) Apparent load(kVA) Protocol code in setting mode
5	Output information	Output voltage(VAC) Output frequency(Hz) Output current(A)

**Note:** Press “FUNC” button to see different information.

## 7. Operation

### 7.1 Operation Mode

#### 1. Turn on the UPS in normal mode

- 1) After you make sure that the power supply connection is correct, and then close the battery breaker (this step only for long backup time model), after that turn on the utility power. At this time the fans rotate, and LCD is on
- 2) Press ON/OFF for about 2.5 seconds, REC LED will green flicker. Inverter will start and the INV green led flickers when REC led is green

#### **NOTE**

*Only be suitable for default setting mode.*

- 3) About several seconds, the UPS turn into normal Line mode. If the utility power is abnormal, the UPS will transfer to Battery mode without output interruption of the UPS.

#### 2. Turn on the UPS from battery without utility power

- 1) After you make sure that the breaker of the battery pack is in the "ON" position (this step only for long backup time model), press the ON/OFF button once to power on the LCD, then press ON/OFF button again for 2.5 seconds when the buzzer alarms
- 2) A few seconds later, the UPS turns into Battery mode, and inverter feeds the load.

#### 3. Turn off the UPS in normal mode

- 1) Press ON/OFF for 2.5 seconds button in condition of normal mode
- 2) Turn off utility power
- 3) If it's a long backup model, open the battery breaker to turn off UPS completely. If it's an internal battery model, wait for 30 seconds and then UPS will shutdown completely.

#### 4. Turn off the UPS in battery mode

- 1) To power off the UPS by pressing the ON/OFF button continuously for more than 2.5 seconds.
- 2) When being powered off, the UPS will turn into No Output mode. Finally not any display is shown on the display panel and no voltage is available from the UPS output.

**NOTICE:** *Please turn off the connected loads before turning on the UPS and turn on the loads one by one after the UPS is working in INVERTER mode. Turn off all of the connected loads before turning off the UPS. The operation above is only suitable for default setting mode.*

## 8. Battery maintenance

1-3KVA UPS only requires minimal maintenance. The batteries used for standard models are value regulated, sealed lead-acid, maintenance free battery. When it being connected to the utility power, whether the UPS is turned on or not, the UPS keeps charging the batteries and also offers the protective function of overcharging and over-discharging.

- The UPS should be charged once every 4 to 6 months if it has not been used for a long time.
- In the regions of hot climates, the battery should be charged and discharged every 2 months. The standard charging time should be at least 12 hours.
- Under normal conditions, the battery life lasts 3 to 5 years. In case if the battery is found in bad condition, earlier replacement should be made.
- Battery replacement should be performed by qualified personnel.
- Replace batteries with the same number and same type of batteries.
- Do not replace the battery individually. All the batteries should be replaced at the same time following the instructions of the battery supplier.

## **9. Notes for battery disposal and replacement procedures**

### **9.1 Battery Disposal**

- 1) Before disposing of batteries, remove jewelry, watches and other metal objects.
- 2) Use rubber gloves and boots, use tools with insulated handles.
- 3) If it is necessary to replace any connection cables, please purchase the original materials from the authorized distributors or service centers, so as to avoid overheating or spark resulting in fire due to insufficient capacity.
- 4) Do not dispose of batteries or battery packs in a fire. The batteries may explode.
- 5) Do not open or mutilate batteries, released electrolyte is highly poisonous and harmful to the skin and eyes.
- 6) Do not short the positive and negative of the battery electrode, otherwise, it may result in electric shock or fire.
- 7) Make sure that there is no voltage before touching the batteries. The battery circuit is not isolated from the input potential circuit. There may be hazardous voltage between the battery terminals and the ground.
- 8) Even though the input breaker is disconnected, the components inside the UPS are still connected with the batteries, and there are potential hazardous voltages. Therefore, before any maintenance and repairs work is carried out, switch off the breaker of the battery pack or disconnect the jumper wire of connecting between the batteries.
- 9) Batteries contain hazardous voltage and current. Battery maintenance such as the battery replacement must be carried out by qualified personnel who are knowledgeable about batteries. No other persons should handle the batteries.

### **9.2 Battery Replacement Procedures**

- 1) Turn off UPS completely.
- 2) Remove covers from the UPS.
- 3) Disconnect the battery wires one by one.
- 4) Remove metal bars which are used to fasten batteries.
- 5) Replace batteries one by one.
- 6) Screw metal bars back to UPS.
- 7) Connect the battery wires one by one. Take care of electrical shock while connecting the last wire.

## 10. Trouble shooting

This section describes checking the UPS' status. This section also indicates various UPS symptoms a user may encounter and provides a troubleshooting guide in the event the UPS develops a problem. Use the following information to determine whether external factors caused the problem and how to remedy the situation.

### 10.1 Checking UPS status

It recommended that checking the UPS operation status every six months.

- Check whether the UPS is faulty: Is the Fault Indicator on? Is the UPS sounding an alarm?
- Check whether the UPS is operating in Bypass mode. Normally, the UPS operates in Normal Mode. If it is operating in Bypass Mode, stop and contact your local representative, or Channel Support.
- Check whether the battery is discharging. When the utility input is normal, the battery should not discharge. If the UPS is operating in Battery Mode, stop and contact your local representative, or Channel Support.

### 10.2 Adjust the factors caused the problem

When the fault indicator is on, press FUNC button to see the fault code and warn code. Fault and warn codes are listed as following:

Code	Event	Possible cause	Solution
7	Battery not connected	Battery not connected	Check if battery switch is off or battery cables are disconnected
10	EPO	Emergency power off	Short the EPO terminal 1&2 to activate EPO
12	Inverter capacity not enough		
16	Warn: Input voltage abnormal	Utility is failure	/
		Input surge protector opens	If utility is normal but rectifier is not working, reset input surge protector
18	Warn: Line neutral wires reversed/PE not grounded	Input Line and neutral is reversed	Check the polarity of line wire and neutral wire
		PE wire is not connected correctly in UPS	Check if PE on input plug is shorted with UPS rear panel. If not, contact with distributor or service center. If yes, please check PE wire in input power socket

20	Warn: Bypass voltage abnormal	Bypass voltage is out of bypass range or is off	Check if utility power is indeed out of range.
24	Warn: Bypass over load	Load is on bypass and is overload	Remove some loads to ensure that total loads is less than 95% of rated capacity
26	Warn: Bypass overload timeout	Load is on bypass and overload. Overload time is longer than the overload capacity of bypass. UPS will shutdown output and loads will loss power.	Remove some loads and restart UPS again. When UPS is working normally, turn on loads one by one.
30	Warn: Transfer times over limit in 1 hour	Transfer times between inverter and bypass is over 5 in recent 1 hour. UPS works in bypass mode.	Check if output is overload or some loads are shorted. Remove the failure loads and restart the UPS or wait for starting inverter automatically.
32	Warn: output shorted	Something shorted	Please remove all loads from UPS output. Check if UPS output is shorted. If not, please check all loads.
34	Warn: End of discharge	UPS works in battery mode for long time after utility failure. UPS output will be off until utility power is on.	Please save your data when UPS alarm "utility fail"
38	Warn: Battery test failure	Battery capacity is low or load is low.	Please ensure that battery voltage is higher than 36VDC and the load is more than 30%.
47	Fault: Rectifier fault	Bus over voltage, bus unbalance, rectifier starting failure, bus under voltage, input fuse is off	Please contact with distributor or service center.



49	Fault: Inverter fault	Inverter over voltage, inverter under voltage,	Please contact with distributor or service center.
51	Fault: UPS over temperature	Environment temperature is higher than permitted point, ventilation is blocked	Please ensure that nothing blocks ventilation and environmental temp must be 0~40°C
53	Fault: Fan failure	One or more fans are failure, fan wires are loosen	Please contact with distributor or service center
55	Fault: Inverter overload	Loads are on inverter and over the capacity of the UPS	Remove some loads to ensure that total loads is under the capacity of the UPS
57	Fault: Inverter overload timeout	Load is over the capacity of the UPS and timeout, UPS will transfer to bypass mode if bypass is available	Remove some loads to under 95%, UPS will transfer to inverter automatically
65	Fault: Battery low	UPS works in battery and battery voltage is low	Recover input power or save data upon "battery low"
71	Fault: Charger fault	There is no charger output.	Please contact with distributor or service center
72	Warn: input over current	Abnormal large current enter in rectifier.	Please contact with distributor or service center
74	Warn: Manual shutdown	UPS will shutdown output or transfer to bypass mode	/
/	Battery discharge time diminishes	The battery has not been fully charged	Charge the battery for more than 10 hours
		UPS is overload	Check the loads and remove some devices
		Battery aged	Replace the batteries. Please contact with distributor or service center to obtain replacement

			components for batteries.
82	Output CT fault	Output CT assembled mistakenly	Check if the output CT has been assembled mistakenly. Assemble the output CT as the device package on PCB.

### NOTICE

*Please provide the following information when reporting fault UPS:*

- 1) *The UPS model and serial NO.*
- 2) *The warn and fault code happened*
- 3) *Detail of fault, include LED indicates, buzzer beeps, power condition, load capacity and configuration of battery(long backup time model)*

## Annex A. Intelligent Slot

There are two types of intelligent slot for option: DB9, phoenix terminator.

Max output current for intelligent slot is 1A.

The functions of intelligent slot are listed as fig.7:

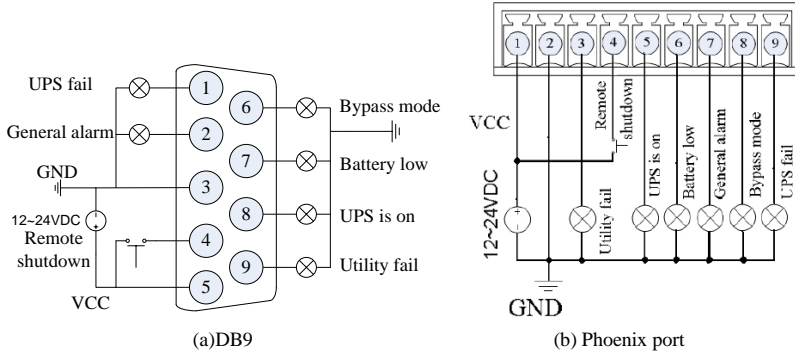


Fig.7 User wiring diagram of intelligent slot

Description of intelligent slot:

Function	Description
UPS fail	Low voltage if something is failure in UPS. If not, high voltage
General alarm	Low voltage if something is abnormal. If not, high voltage
GND	Common connection
Remote shutdown	UPS shutdowns rectifier and inverter if utility is normal. UPS shutdowns completely if in battery mode. Close switch to activate.
Power supply	12VDC~24VDC, external power supply
Bypass mode	High voltage if UPS works in bypass mode. If not, low voltage
Battery low	Low voltage if battery voltage is low. If not, high voltage
Normal mode	High voltage if UPS works in normal mode. If not, low voltage
Utility fail	Low voltage if utility is failure. If not, high voltage.

## Annex B. EPO / External Battery Pack

### EPO

EPO (emergency power off) is function to shutdown UPS completely at emergency condition. This function can be activated through a remote contact provided by the user. It requires opening NO and +24V at normal operation. EPO is activated when shorting NO and +24V.

Description of Input Port for Remote EPO

Position	Name	Purpose
P1	+24V	+24V, internal power supply
P2	EPO_NO	EPO is activated when shorting with +24V

### EXTERNAL BATTERY PACK

Notice: 1. Please re-start the UPS after finish the parallel connection.

2. please finish the battery charging (8~16 hrs) before using.

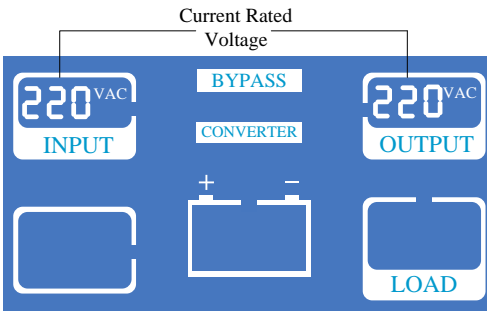
#### SPEC of Battery pack

Model	BP-1000	BP-2000	BP-3000
DC	36V	72V	2x0Vac 96V, 1x0Vac 72V
Battery type	12V7Ah 3pcs 2set	12V7Ah 6pcs 1set	12V7Ah 8pcs 2set 12V7Ah 6pcs 1set
	12V9Ah 3pcs 2set	12V9Ah 6pcs 1set	12V9Ah 8pcs 2set 12V9Ah 6pcs 1set
Dimension (W*D*H)	144x353x222mm		1x0Vac : DC72V 14x353x222mm 2x0Vac : DC96V 190x502x335mm
Weight (kg)	16kg	20kg	DC96V 47kg, DC72V 20kg

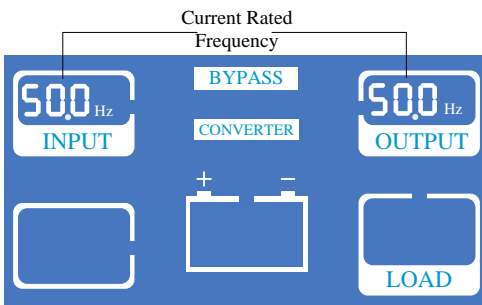
## Annex C. Rated Parameters Setting

Rated parameters of DS-I (L) 1-3K UPS can be set from panel. Please set rated parameters in according to the following procedures:

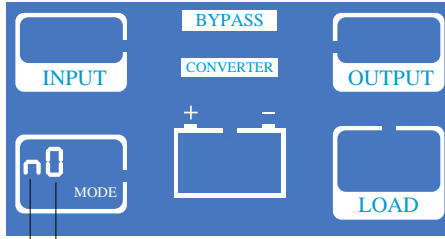
- 1) Start UPS power supply and ensure that rectifier, inverter, bypass and discharge are not working.
- 2) Press ON/OFF and FUNC together for 2.5 seconds to enter in setting mode, all LEDs flicker.
- 3) Voltage setting: press FUNC to change rated voltage. Shown as following:



- 4) Frequency setting: Press ON/OFF to choose voltage and enter in frequency setting. Press FUNC to change rated frequency. Shown as following:

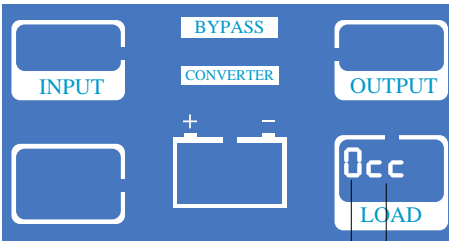


- 5) Mode setting: press ON/OFF to choose frequency and enter in mode setting, press FUNC to change mode. First code: n-normal mode, E-ECO mode. Second code indicated current voltage/frequency are listed in description of main menu in section 6.



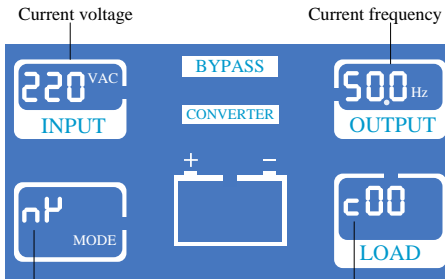
Current mode  
Current voltage/frequency

- 6) Protocol setting: press ON/OFF to choose mode and enter in protocol setting. Codes are shown in LOAD, press FUNC to change protocol. First code: 0-Modbus, 1-SNT, "CC"-current protocol.



Protocol setting

- 7) Press ON/OFF to choose protocol and display current setting.



Current voltage

Current frequency

Current mode

Current protocol

- 8) Press ON/OFF to save current setting and exit. If want to change, press FUNC and repeat the procedures above.
- 9) If you want to exit from setting mode and give up saving, press ON/OFF and FUNC together for 2.5 seconds when in setting mode.
- 10) Restart and check if the setting is right.